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Research Article

Evaluation on Forest Management Plan with Participatory Following Collective Forest Tenure Reform ----A Case Study of Sanming, China

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Abstract: Forest management planning on private forestland is a cornerstone practice for promoting long-term stewardship. It can effectively guide forestry farmers to engage in forestry management. Formulation of forest management plan after collective forest tenure reform by applying participatory method on case village. Based on integration the knowledge of different stakeholders about forest management, analysis of the situation of forest management and problem on case village, we formulated an effective forest management plan and improved the knowledge and ability of different participants. Some suggestions was put forward on the process of formulation included forest resources investigation, forest cultivation and forest management effect monitoring and assessment. In addition, the government policies, investment subsidies and technical support should therefore be enhanced to implement forest management plan.

Keywords: Collective forest tenure reform, forest farmer, forest management, participatory

INTRODUCTION

Since 2003, a new round of collective forest tenure reforms has been sweeping across rural China. For the previous forest resources management system, in the context of collective forest management, local government make forestry policy instrument only for satisfying demands of their owner interest and ignoring the dominant role of forestry farmers. Therefore, it is difficult for diversified or cooperative management to promote effective distribution of forest resources. After the collective forest tenure reform, how to strengthen forest resources management, how to improve management level and how to increase the revenue of forestry farmers as well as their cooperative organizations have become key issues which may influence the reform effect and sustainability.

The participatory method has been introduced to China since 1980s by international organizations. It has produced a marked effect in China's countryside, forestry and social development programs and made up for the weak points in the development of Chinese traditional society. In forestry field, the participatory approach, especially the formulation and implementation of participatory forest resources management plan, has made a difference in design, implementation and management of 6 key forestry programs and resources management based on communities (Liu *et al*., 2010). It has also played an important role in the reserve and community-based management as well as the Chinese forestry programs organized by World Bank, Food and Agricultural Organization (FAO, 2003), the EU and other international organizations. Practice has proved that participatory approach is an idea, a thought and a method which is in accordance with the reality of China's forestry development, while the community-based participatory management of forest resources has also been identified as an effective way to fully stimulate the initiative of the community masses in forestry management and better coordinate the relations between various stakeholders as well as improve the forest resources administration (Sepp and Mansur, 2006). Therefore, a scientific evaluation of forest management with participatory method, which takes all the influent factors into consideration, such as the status of local forest resource, the knowledge about forest management of local forest farmers, social-economics factors and the level of cooperative organization's management. It can effectively guide forestry farmers to engage in forestry management (Liu *et al*., 2011). Moreover, the awareness and ability of forest management for forestry farmers' and their cooperative organizations can be streng then. Promoting their initiative in the forest management system and policy reform and improving forestry farmers' participatory degree in constructing the follow-up policies after the reform.

Much of the literature has highlighted that forest management plan with participatory has been

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significant in forest management development (Sheppard, 2005; Parrotta and Trosper, 2011) and that a qualitative approach has been developed (Valencia-Sandoval *et al*., 2010). However, few researches applied participatory method to make the forest management involved all the. Thus, this study applied Participatory Rural Assessment (PRA) to deeply understand about the status of local cooperative's resources management and its organizing structure and operating pattern as to provide enough and detailed background materials for the succeeding policy study. In order to know different stakeholders' attitudes and thoughts on the forest management policy and institution, as to fully comprehend different stakeholders' requirements and attitudes on certain related policy and institution (Fagerholm *et al*., 2012). And Make SWOT analysis on forest management policy and institution from the forest farmers' perspectives, find out the main problems existed in the present polices and institutions and make target-oriented policy proposals. The objective of this study is to review the impacts of current pro-market land policy and the ways forward for tenure reform in China.

MATERIALS AND METHODS

Study site: Youxi is rich in forestry resources, as one of 48 important collective regions in Southern China. More than 80% of forest owned by collective. The study was conducted in Mayang community, located in the west of Youxi. It is only 19 km away from the downtown with an altitude of 250-354 m. The acreage of Mayang Village is 19,602, with 65.2% of forest cover and 85.9% forest greening rate, the main forest products are high-quality commercial timber, bamboo, tea oil, etc. (Mayang 's forest resource plan and design, 2010) In 2004, as the forest reform pilot village, this village established the Mayang Stock Cooperative forest farm Co. Ltd with board of directors and the board of supervisors so that it runs in a company operation system. At the same time, the company own 11,543 acres of collective land and involved all the farmers in Mayang, 100% areas of reform and 100% registration and certification of forest right.

Materials: A self-administered, closed-ended survey instrument was developed and sent to selected households in January of 2011. In the training of making the participatory management program, the main target groups who took part in the training and collected information are shown in Table 1.

Methods: The study employed literature and based on the designed research plan, the research team have made semi-structure interviews with the cooperative members and some related stakeholders and made filed research on the case community. Researchers have concluded the major policy and institution problems that affect the operation and management of forestry resources, made evaluations on the related forestry resources management policy that issued after the Forest Tenure Reform and put forward suggestions for improvement. The main methods that the research team has taken are listed as the following:

First, specify the literature and training materials. By studying forest management programs over the world, especially pay attention to the planning methods, problems and successful experience of the participatory forest resource management plan which is implemented in China by community-based. Combined with the training materials provided by the program sponsor, taking into account the characteristics of the trainees, specify the teaching materials, then form a more specific and operational training scheme.

Second, adapt the questionnaire survey and semi-structured interviews. In the implementation of the project, through the questionnaire survey we get the knowledge about the situation of production and operation and the current demands for forest management plan. And through semi-structured interviews, we interact with staff in Youxi Forestry Bureau and the Xicheng Town Forestry Station, understand the existing problems during the management process from the administrator's point of view, enabling a more comprehensive understanding of the local forest business related activities.

RESULTS

Firstly, the study analyzed the attitude and perception to forest management policy and institution

Table 1: Target people and collected information

Interviewee	Intended information
Head of the stock cooperation Forestry center	Basic conditions of forestry production; problems and needs in the forest resources management; problems in the development and running of stock cooperation forestry center; suggestions to the improvement of forestry policies and system.
Members of the stock cooperation forestry center	Basic conditions of forestry production; problems and needs in the forest resources management; motivations and benefits in participating the Stock Cooperation Forestry Center; suggestions to the improvement of forestry policies and system.
Village leaders	The whole situation of forest resources and forest management; suggestions to the development of stock forestry center and the participatory forest management.
The town government	Local regulations on forest resources management; suggestions to the development of FFCs and the participatory forest management.
County forestry bureau	County regulations on forest resources management; suggestions to the development of stock cooperation forestry center and participatory forest management; the directions in improving the local forestry policies.

from stakeholders. Stakeholders are any holders that affected by the decisions and actions of the organization in the external environment. Stakeholders can influence organization, their views must be considered as a factor in decision-making. People who participate in this training activities of stakeholders conclude technical personnel, members of County Forestry Bureau, Forestry station members, village committees, equity joint head of the farm forestry, farmers, etc., By brainstorming, participatory discussion, etc., this research learned about the different stakeholders hold the awareness of commonalities and also differences on forest management policies and systems. And also understood the requirements that members of the cooperative have on forestry policies and forest management system.

For the forestry taxation, members of the cooperation believe in tax fairness and can be affordable. The main reason is due to the current tax is borne by the contractor. And for the logging quota system, members of the cooperation consider it fair. Cooperation organization, from the micro situation, can better plan and update the annual amount of deforestation and cooperative organizations can apply for the cutting index more easily. For silviculture fund system, members of the cooperation believe it reasonable, cooperative organizations take out a fixed percentage of the total revenue every year as silviculture fund to ensure the consisting management of forestry and the completing the improvements of that forestry can be very good going to complete the forest roads and other infrastructure. For compensation for the ecological forest system, members of the cooperation believe it is fair. As the local ecological forest area is small, it has little effect on the local forestry management.

Non-forestry farmer cooperative members believe that tax burden in the past is heavier, but now the policy has reduced the burden of forestry management. However, they did not satisfied with the cutting quota system, considered that quota logging index application is rather difficult and it is hard to ensure just, fair and open. They considered it reasonable as to the silviculture fund. Some members think compensation for ecological forests is too little that is not conducive for the farmers to better manage and protect the investment process. Generally consider it very good to carry out forest insurance subsidies which can reduce the risk, but there are households think it of little use since farmers themselves usually have fire safety measures.

Staff of County Forestry Bureau and Forestry station thinks that the forestry tax reduction on the one hand reduced the tax burden on farmers, making it easier to see economic benefits for farmers, but on the other hand reduced financial income. Staff believes that the implementation of quota logging system is from a macro aspect to ensure sustainable forest management, but in the specific implementation process, how to ensure transparent and fair allocation of harvest index, is the primary problem to be solved. Meanwhile, the procedures to apply for the logging index should be simplified and the application time should be shortened.

In addition, SWOT analysis was applied to understand the forest management policies and institution from farmers'. SWOT analysis is a strategic analysis that, analysis by organizing their own conditions and external environment to identify

Table 2: SWOT matrix analysis on forest management policies and institution of Mayang Village

Internal environment	Strength	Weakness
External environment	Standardize the management behavior as the main forest management subjective. Policies and regulations are mandatory. Strengthened infrastructure construction in forest areas, improved forest management and operating conditions. The establishment of innovation incentive mechanism policy can improve the ability of farmers to manage.	Policy advocacy and implementation of the system lags far behind the policy formulation supporting forest policy reform: inadequate forest policy of insurance and forest mortgage it takes time and is complicate. The policy and system monitoring system is imperfect.
Opportunity	SO (Growth strategy)	WO (Reverse strategy)
A relatively high satisfaction on forest reform policy greater demand for supporting forest reform policies (forest mortgage loaning policy) farmers have become the subject of forest management attention the government of forestry paid to forestry development.	Forest resource intensive management Increase income and revenue of forestry and agriculture.	Increase investment in forestry improve forest policy reform package improve policies and supervision system.
Threat	ST (Diversified economy strategy)	WT (Defense strategy)
The conflict between the pursuit of multi-functional benefits of forest resources and the local social and economic development. The opacity of the policy implementation process the relatively low quality of farmers.	A variety of sustainable forest management Coordination of resource use with protection unity of economic, ecological and social benefits.	To advocate efforts to increase forest to ensure the implementation of forestry policy to improve the level of farmers in forest management.

organizational strengths, weaknesses, opportunities and threats, of which, S represents strength, W represents weakness, O represents opportunity, T represents threat; S, W is the internal factors, O, T is the external factors. The purpose of SWOT analysis is to find out a way to combine the internal resources and external opportunities to determine the future direction of development. The SWOT analysis of Mayang Cooperation's forest management policy strategy is shown in Table 2.

Inherent advantages are mainly reflected in:

- Standardized the management behavior as the main forest management subjective.
- Policies and regulations are mandatory.
- Strengthened infrastructure construction in forest areas, improved forest management and operating conditions
- The establishment of innovation incentive mechanism to improve forest management and forest products processing technologies, promoted the invention and application of high technology
- Policy can improve the ability of farmers to manage.

Inherent disadvantages are mainly reflected in:

- Policy advocacy and implementation of the system lags far behind the policy formulation
- Supporting forest policy reform: inadequate forest policy of insurance and forest mortgage
- It takes time and is complicated to apply for the cutting index
- The policy and system monitoring system is imperfect.

External opportunities are mainly reflected in:

- A relatively high satisfaction on forest reform policy
- Greater demand for supporting forest reform policies (forest mortgage loaning policy)
- Farmers have become the subject of forest management
- Compensation policies, all types of discount government, abolition of fees and reducing taxes and other benefits forest policy, increase farmers income in forestry.
- The attention the government of forestry paid to forestry development.

External threats are mainly reflected in:

- The conflict between the pursuit of multi-functional benefits of forest resources and the local social and economic development
- The opacity of the policy implementation process
- The relatively low quality of farmers

Through the interviews about Mayang Village 's current main forest resources management policy and system, we found that the main existing problem of the policy is the effect in the process of actual operation is not ideal or difficult to implement, mainly because the policy operation system is imperfect. As to implementation of specific policies, in Mayang Village, has reflected in the following areas:

Forest management as the basis and prerequisite of the development of forestry, the achievement of its continuing business goal is influenced by forestry science and technology policy to a large extent. The main tree species in Mayang Village forest management are pine, fir, tea and bamboo, etc., which are pure forest management. In the research, forest management stakeholders said that the operation of mixed forest is more scientific, more cost-effective, but due to the impact of history, science and technology policy orientation is not yet consistent with forestry in their orientation; forestry science and technology input channels are single, capital investment is not enough, the scientific and technological achievements are relatively insufficient, forestry science and technology promoting network is imperfect, the transformation rate of achievements is low.

Scientific and accurate implementation of forest logging quota system is the primary guarantee of the executing process. In accordance with existing logging system, the fundamental basis of forest logging quota preparation is the reasonable amount of cutting (the annual cutting quota index) grass-roots units in the forest management plan. In theory, the business units raise the annual cutting quota based on outcome of forest resources planning and design survey, but due to the dynamic nature of forest resources and their complexity, the number of forest resources, quality and internal structure are in constant changes, this kind of characteristics determine the inaccuracies of the forest area and the number in stock that grassroots units reported. In its research, staff in Mayang Cooperation said that the current mode adopted to manage forest resources is more scientific, the index for logging is also enough. However, as to some public welfare forests whose growth cycle has reached the age of deforestation, due to certain policies that forbid the public welfare forests to be cut, resulting in a waste of resources. Meanwhile, fir, pine and other forest commodities prices subject largely to market fluctuations, in order to maximize the economic benefits, contradictory was generated between the real needs of farmers and logging quota management system.

Compensation for ecological forests currently in Mayang village is to pay the compensation in payments of wages to the three forest rangers. Ecological forest compensation has only solved the problem of shortage of daily management funds, but still no source of productive capital investment. There are considerable areas of natural ecological forest which has dilapidated look, poor quality, fragile ecological functions, they

need for artificial rearing and reform. After the implementation of benefit compensation, the allocation and use of dispersion compensation funds, tending and transformation of public financing become more difficult, organized public tending action cannot be carried out, the quality of forest stand cannot be elevated. According to regulations, the forestry sector is responsible for overseeing the implementation of forest protection, but in fact, it is difficult to implement effective supervision. Even if the farmers were found to have a problem in management and protection, it cannot be dealt with timely. After the implement of collective forestry right reform system, the protection and supervision that forestry administrative department do to the collective forest management is actually useless.

In the modern era of commodity economy, labor and materials, machinery, technology and management devoted to strengthen forestry production and management mostly need outsourcing, so it has a decisive influence on improving the level of forest management for farmers to raise production funds. In the investigation, farmers generally consider that the biggest difficulty of expanding is lack of funds. Live tree has a dual economic attributes of both products and input stumpage. Most of the time before being harvested in the state of capital goods, is an asset. The right to carry out forest standing mortgage loan, people can make an inventory of assets, solve the problem of lacking follow-up operating funds. However, in Mayang Village, currently the forest right mortgage on the whole is at the initial state which has small financing scale and complicated procedures with no farmers have access to mortgage loans and that cannot meet the farmers' financing needs for further business investment.

DISCUSSION AND CONCLUSION

Policy formulation and implementation is mainly made based on the views of government departments rather than the views of the villagers and the effective operation of forest management policy system depends on the coordination and interaction among policy subject, object and environment in Mayang. Therefore forest management plan in the future should emphasis on investigation and adopt the method of "from bottom to top" to make policies to ensure the scientificity and operability of the policy. At the same time, we should strengthen the policy advocacy and decomposition, ready for financial and material preparation, policy experiments, so that the villagers can truly participate in policy formulation, implementation and feedback, to promptly discover the policy slippage and feedback. We should flexibly use means of administrative, legal, economic fields and ideological induction. Emphasis on policy evaluation, strengthen the monitoring on policy running, timely end or update the policy.

The goal of forest management technology policy is to promote the development and prosperity of forestry science and technology and the effective conversion of the relevant scientific and technological achievements to provide favorable policy support for the construction of sustainable forest management goals. Science and technology policy include: from the strategic perspective of science and technology policy development, in Mayang Village's situation, on account of the fact that different crops such as fir and pine, commercial forestry and ecological forest have different requirements of science and technology policy, to develop technology policy in line with the local forest classification management; by making use of advanced technology to promote policy, to improve the efficiency of scientific and technological achievements at the same time of classification management of forest resources in Mayang Village; to strengthen scientific and technological investment policy and improve the science and technology outputs; To enhance the the incentive policies and mechanisms of the scientific and technological personnel.

Under the principle to ensure sustainable forest management, under the premise that 5-year logging quota does not exceed the total 5-year growth of forest resources, appropriate adjustments of annual logging quota in 5 years is allowed according to local forest market conditions and demand of wood, so as to fully mobilize the enthusiasm of farmers, give full play to the market economy's role in the allocation of resources.

In Mayang Village, on one hand the people or even the collective economy depend highly on forest logging, on the other hand there are a great amount of young forest need to be nurtured and managed, resulting in a serious shortage of logging index. The solution is, it should allow the provincial forestry department or municipal forestry authorities on behalf of the government to carry out appropriate adjustment. The two sides can properly adjust the economic compensation, the aim of the adjustment is to strengthen the forest cultivation and promote sustainable management; meanwhile, as to the ecological forests that exceed the age limit of logging and moderate cutting is allowed to avoid waste of resources.

Forestry finance, insurance and social service system reforms are important guarantee for collective forestry to develop healthily in a long term. However, it cannot be solved by only accounting on the forestry department, a lot of authorities beyond the forestry department should adhere to the high drive, form the mode of government-led, forestry departments to strengthen in coordination with other departments to promote; for supporting reform is not the number of temporary job performance, the core is to promote the development of forestry in these areas to support the establishment of the system, then to achieve optimal forestry external business environment. To establish Mayang Village Forestry Services Branch to achieve interconnection, interaction, network-based services

between counties, providing services such as forestry information dissemination, policy advice, practical technology, property transactions, asset evaluation and other services for farmers, provide a good external business environment for better management of forest resources and improve forest management standards.

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